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NEWS LETTER

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Bob. Fitzgerald

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The chief purpose of this publication is to distribute information on aeronautics to the flying personnel in the Regular Army, Reserve Corps, National Guard, and others connected with aviation. Publishers are authorized to reprint material appearing herein, except that portion of the News Letter beginning with Notes from Air Corps Fields.

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AIR CORPS PROGRESS DURING INCUMBENCY OF ASSISTANT SECRETARY DAVISON

THE story of the Hon. F. Trubee Davison's incumbency of the office of Assistant Secretary of War for Aeronautics has been the story of the Five-Year Program for the development of the Army's flying arm. Two weeks after Congress had acted on the recommendations of the Morrow Aircraft Board by its Act of July 2, 1926, Mr. Davison took the oath of office. He found an Act that authorized a certain program, but no funds appropriated by Congress for this development program and no plans for the coordinated efforts of all concerned in the growth that the Air Corps was due to experience.

For the next few months he directed the work of the preparation of estimates for the next fiscal year (1928), whereby the Air Corps could procure the authorized increase in airplanes and flying personnel. The result was an increase of four and one-half million dollars in Air Corps appropriations for F.Y. 1928 over the $16,937,500 for 1927, and further increases until the peek, in 1931, of $35,823,473. The presence of an Assistant Secretary was necessary, not only to relieve the Secretary of War in the work of coordinating the increase in Air Corps personnel, but to assume direct responsibility for the Administration in the matter of airplane procurement. A new policy of procurement of experimental aircraft and engines was instituted, based on the Air Corps Cooperative Policy. This policy eliminated the old method of competitive bidding, experimental design competitions and sole source contracts which had all proved very unsatisfactory and in their places substituted a cooperative agreement of mutual benefit to manufacturer and government alike. It now enables the government to terminate experimental contracts at any time should the article not meet requirements or justify further expenditure of funds, and at the same time recognizes any legitimate charges or proprietary rights involved. Under this policy it has been possible to shorten the time required to develop experimental equipment from its inception to the production stage of one year, and to pay for it on an actual cost basis.

In 1927, the new site of the Air Corps Materiel Division was dedicated at Wright Field outside of the city of Dayton, Ohio. The testing facilities there are now the finest in the world, particularly those for testing aircraft engines and propellers. The Power Plant Laboratory is equipped with ten dynamometer stands for testing aircraft engines, both air and liquid cooled types, up to 1500 horse power, as well as engine cylinders of all types and sizes.

Equipment is now being installed which will make it possible to test aircraft engines at simulated altitudes as high as 30,000 feet. This installation includes special air-conditioning apparatus capable of cooling 185pounds of air per minute as required for the carburetors of a 1500-horsepower engine, from maximum summer temperatures to temperatures as low as 55 degrees below zero Fahrenheit. A refrigerated test room is also provided for testing liquid-cooled engines developing as much as 800 horsepower in severe winter temperatures of minus 40 degrees Fahrenheit, using carburetor air cooled to the same temperature.

A new torque stand building, recently constructed at Wright Field, provides for the endurance testing of engines and propellers under installation conditions on the airplane. There are seven torque stands of the fixed type, with clearance for swinging propellers and test clubs as large as 18 feet in diameter. In their construction, noise, vibration, and fire hazard have been reduced to the minimum.

The Propeller Testing Laboratory, the only one of its kind in the world, is in an advanced stage of completion. The three whirl stands or test rigs are equipped with electric, propeller driving motors, capable of whirling propellers up to a diameter of 40 feet. These motors develop 2500, 3000 and 8000 horsepower, respectively. The rotating electrical machinery installed in the propeller laboratory aggregates over 48,000 horsepower.

The increase in the high speed performance of military airplanes has been outstanding, particularly in the case of all new tactical types. This increase is largely the result of aerodynamic refinement of the airplane structure, the reduction of drag through the use of retractable landing gear, and the greater engine power. The principal contributions to structural refinement involve the increasing use of low wing monoplane construction, cantilever metal wings, metal monocoque fuselages, inclosed cockpits, retractable landing gears and streamline wheels.

Engine development has no doubt been the greatest factor in increasing performance through the use of higher compression, supercharging, ground boosting, variable pitch propellers, and fuels of higher knock-rating. The American-built air-cooled engine has become more efficient and reliable than those built in foreign countries and has been developed to give a maximum output of 600 horsepower in its present state of development. The liquid-cooled engine has progressed toward the 1,000 h.p. unit. The use of high temperature coolants such as ethylene glycol permits higher operating temperatures and reduces the amount of radiation required fully 70 percent with consequent reduction in installed weight. Power increases and new alloys have brought engine weights close to one pound per horsepower, one-half that of the wartime Liberty.

Further increases in performance have been achieved by means of variable pitch propellers. Reduction in the weight of the blade has been obtained through the use of welded aluminum and new alloys of magnesium. The hollow steel propeller has been brought to a practical stage of development. The turbo supercharger has been brought to a high state of development, both in the gear-driven type as used on air-cooled engines and in the exhaust-driven type as used on liquid-cooled engines. In combination with controllable or automatic propellers now on service test, it will be possible to obtain maximum performance from supercharged engines at all altitudes instead of at a specific altitude as at present.

Within the past two years a complete new complement of armament has been developed for all types of aircraft, both experimental and service test. Among the items causing a decided change in design of tactical types are the electrically-operated, external bomb racks and

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release mechanisms, the inside track mount providing a 360-degree angle of fire for flexible machine guns, the relocation of the fixed synchronized guns away from the instrument board to facilitate loading and servicing, and the mounting of free guns in the wing leading edge or landing gear fairing for attack purposes. Bomb sights with automatic release mechanisms have actually made possible greater accuracy in bombing from high speed airplanes at high altitudes.

The solution of the difficult problem of fog-flying and blind-landing has met with considerable success through the application of radio and other electrical phenomena. The system developed by the Air Corps is so simple that it requires no additional radio equipment in the airplane other than a radio compass and a boundary marker short wave pick-up, and only a very small light weight transmitter for ground use. In demonstration flights an Air Corps pilot (Capt. Hegenberger) was the first aviator ever to make a successful solo flight, taking off and returning to the starting point without vision outside of the enclosed cockpit, depending solely on the use of instruments. The success of the system marks a great advance in the art of avigation, both from commercial and military standpoints. Investigations have been extended to the development of portable radio beacons and electrified underground cables for localizing landing areas and paths for approach through fog and darkness.

Development of radio communication equipment has produced new aircraft command sets and universal receivers, having ranges of frequencies from 235 to 8000 kilocycles by use of plug-in coils.

For aerial mapping the Air Corps has produced the T-3A (five lens) camera which has been used extensively by the U.S. Geological Survey, the U.S. Coast and Geodetic Survey, and the Corps of Engineers in obtaining photographs for use in preparing maps of several inaccessible regions of the United States. Another camera has been specially developed for taking high altitude photographs and for making large scale mosaics. Other photographic equipment has been developed by the Air Corps for night photography, quick-work photographing, and long distance photography. A record photograph for distance of 331 miles was taken of Mount Shasta, Calif., in January, 1932, with an Air Corps camera equipped with special lens, infra red filter and infra red sensitive film.

At present there are few, if any, pre-program airplanes still classed as "in commission" in the Air Corps. Not only have they all been replaced by those of more modern design, but replacements have also been made for airplanes of the later types which were worn out through ordinary wear and tear or which were destroyed by accidents.

The following table indicates the difference in the airplanes on hand since Mr. Davison took office:

	June 30, 1926	June 30,1933 (Production funds only)	Increase
Pursuit	126	439	313
Bombardment	83	156	73
Attack	0	108	108
Observation and Photographic	578	412	less 166
Cargo, Training and miscellaneous.	467	531	64
Total	1254	1646	392

In other words, the 1254 airplanes have practically all been replaced and 392 more airplanes added, to June 30th last, not counting those other airplanes, delivered since 1926, which have given up the ghost in the course of their operation. In 1926 there were no special types of photographic airplanes and no attack airplanes. A number of observation models were used in cases where the basic training models now give far more efficient service, and this accounts in some measure for the present decrease in the number of observation airplanes.

During the same period, purchases out of production funds have totalled as follows for the various types:

Pursuit airplanes - 634	$11,319,336.
Bombardment airplanes - 230	9,951,274.
Attack airplanes - 164	3,651,536.
Observation and Photographic-578	11,676,775.
Cargo, Training, Ambulance, Miscallaneous - 659	10,698,733.
Total - 2265	$47,497,654.

The Air Corps, however, needs more than airplanes with which to perform its work. It needs pilots, mechanics, clerks, engineers and administrators, and these people as well as the airplanes which they keep in the air, must be housed. From July 1, 1926, to the present date, $31,975,655 has been spent on housing of personnel and $17,079,119 for the storage of airplanes and technical equipment. Real cities have sprung up in those years in the shape of Air Corps stations, and other stations have been brought to an active status and modern buildings erected in the place of temporary shacks and hangars built on them during the emergency of the World War.

Randolph Field, the Air Corps Primary Flying School, near San Antonio, Texas, and Barksdale Field at Shreveport, La., the home of the 20th Pursuit Group, to which will be added the 3rd Attack Group, were farm lands prior to 1936. March Field, Riverside, Calif. has been placed on active status and rebuilt; and after housing one of two primary flying schools is now the home of one of the largest air commands in the world, the 1st Bombardment Wing. The Air Corps Tactical School was recently moved from Langley Field, Va., to a new enlarged station at Maxwell Field, Montgomery, Ala., and the 8th Pursuit Group was then organized at Langley Field to combine with the 2nd Bombardment Group already there and constitute the 2nd Bombardment Wing.

Albrook Field, on the Pacific side in the Canal Zone, is now an active field, and Hamilton and Benton Fields in the San Francisco Bay region are rapidly taking shape. A new Bolling Field is being built just south of the original but inadequate old field at Washington, D.C.

One of Mr. Davison's last official acts was the approval of orders for the organization of the five additional Pursuit squadrons necessary under the terms of the 5-year program.

To man such units, an increase in personnel has naturally been necessary, as follows:

	Air Corps Officers	Officers Detailed in Air Corps	Enlisted Men	Flying Cadets
1926	884	35	8,583	142
Present	1243	107	13,038	252
Increase	359	72	4,455	110

Practically all those officers detailed in the Air Corps are those undergoing flying training at the Flying Schools with a view of transferring permanently to the Air Corps. These schools, and there are several others in the Air Corps besides the flying schools, play an important part in keeping such personnel in a high state of training. From the day that the Office of Assistant Secretary of War for Aeronautics was authorized to the present, 5670 graduates have passed through one or the other of the Air Corps Schools. Those receiving their wings and the rating of Airplane Pilot at Kelly Field numbered

316 officers, 1063 flying cadets, 13 noncommissioned officers and 17 officers and enlisted men of other armies. To this number should be added the aggregate of 21 graduates of all categories from the Lighter-than-Air School at Scott Field, Ill., inoperative since 1929. The Technical School at Chanute Field, Rantoul, Ill., has graduated 210 officers of the Regular Army, Reserve and National Guard Air Corps; 3395 enlisted men of the Air Corps and National Guard, 70 members of other branches of our armed forces, and 23 of other countries. The Engineering School, now at Wright Field, Dayton, Ohio, has graduated 65 officers and 2 Naval officers, and the Tactical School, now at Maxwell Field, Ala., has graduated 103 Air Corps officers, 65 Regular Army officers of other branches of the Army, and 7 officers of other countries. In addition there have been 135 Air Corps graduates of other service schools or of civilian institutions offering specialized courses. Notable records and accomplishments of a high order during Mr. Davison's tenure of office have been numerous. Some of these have gained the designation of "the most meritorious flight or flights of the year in the Army" and have thus earned the award of the Mackay Trophy. Such was the Pan-American Flight, commanded by Major Herbert A. Dargue, in 1926; the California-Hawaii flight of Lieuts. Lester J. Maitland and Albert F. Hegenberger in 1927; the flight-spinning tests of Lieut. Harry A. Sutton in 1928; the high altitude flights and photography of Captain Albert W. Stevens in 1929; the Arctic Patrol Flight of the 1st Pursuit Group led by Major Ralph Royce in 1930, and the flight of the huge fleet of 672 airplanes of the 1st Provisional Air Division in 1931 for which leadership the Trophy was awarded the then Assistant Chief of the Air Corps, Brigadier General B.D. Foulois. The Mackay Trophy has not yet been awarded for 1932, but two notable flights will probably be considered by the Awards Board in this respect, the previously mentioned blind solo flight of Lt. Hegenberger and the flight of the 11th Bombardment Squadron commanded by Lieut. Charles H. Howard from March Field in January, whereby tons of food were dropped to thousands of stormbound and starving Navajo Indians in Northern Arizona.

One or more field exercises or concentrations have been held each year except 1932. In some of them the Air Corps has pitted certain of its components against other of its own units. Others have been combined exercises in the use of air and ground arms, such as the Air Corps Anti-Aircraft tests at Fort Humphreys, Va., in 1931, in which valuable data were obtained which should make for greater efficiency in both these branches of the Army.

As incumbent of the office of Assistant Secretary of War for Aeronautics, Mr. Davison has not necessarily confined himself to this office's physical limits. He has flown many hundreds of hours, and at high speed, to and from various Air Corps fields for which he has been responsible and so kept in touch with the Air Corps and its activities.

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MAJOR BRETT DELIVERS RADIO TALK

Major George H. Brett, Commanding Officer of Selfridge Field, Mt. Clemens, Mich., recently gave a radio talk over Station WXYZ of Detroit, under the auspices of the Sandlot League of that city, an organization whose purpose is to develop athletics among the boys and girls. The subject of Major Brett's talk was "Teamwork," and it illustrated from his own experience in the Air Corps what he knew about the subject. The text of the talk was as follows:

"Having gone through the various stages of youth with probably the normal experiences of the average boy and young man and having now been engaged for seventeen years on probably one of the most dangerous types of work existing in present civilization, I feel that I am in a position to at least express an opinion on the subject of team work. The boy or young man who enters competition as an individual neglects one very important phase of training, and that is the ability to appreciate coordination and cooperation with other individuals. The boy or young man who concentrates his athletic activities on sports where the individual is not dependent upon others is usually the worst fault finder with his own team whenever he is thrown into sports which involve team work.

Now, taking up the subject of flying, we have had through the past ten years many remarkable individual performance flights, and yet, to me, the most remarkable thing in the flying field today is to see a group of airplanes maneuvering through the air.

In the case of the individual performance flight, the man has nothing to worry about but himself. He and his airplane are the most important things in the world to him, and in all his decisions he is controlled purely by self-preservation and the accomplishment of the work which he has started out to perform.

On the other hand, take the man who is flying as a wing man in a formation of eighteen airplanes, half way back through the formation. He must not only think of himself, but he must keep constantly in mind that any mistake on his part, any miscalculation or carelessness, may result in either injury or death to two or three men in his immediate vicinity. Although he is flying alone he must constantly bear in mind the fact that he carries the responsibility for the lives of other pilots. Quick thinking, coordination, cooperation, confidence in the ability of others is developed to the highest degree, and all young men who are working on teams should have, to the highest attainable degree, the same objectives.

From the standpoint of sportsmanship there also enters into the air game the actual protection of other people. We have all read of the accident of Hinds in Detroit some two months ago, where the pilot, to protect the lives of children, wrecked his plane, with the possibility of injuring himself. In addition to that, we have numerous instances where a pilot carrying a passenger has actually landed his airplane under the most adverse conditions due to the fact that he was unable to make his passenger jump with the parachute. There are other cases wherein the pilot has been killed due to the fact that he could not get his passenger to jump until too late.

To my way of thinking this is the highest type of sportsmanship. In order to be a good athlete one must be a good sportsman, have excellent coordination, mental and muscular, and must be able to cooperate to the highest degree and have utmost confidence in his teammates."

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A Board of Officers, appointed by the Chief of the Air Corps, consisting of Lieut.-Colonel James A. Mars, Major Frank D. Lackland, Captains Ross G. Hoyt, William D. Wheeler, Samuel C. Skemp, William A. Hayward, Eugene L. Eubank, Charles C. Chauncey, and 1st Lieut. Harry A. Halverson, met Monday, February 27th, at Chanute Field, and adjourned the following Friday, after having accomplished their mission, that is, making recommendations for the consolidation of courses and the improvement of the Air Corps Technical School, Chanute

Field, Rantoul, Ill. All visiting officers expressed themselves as surprised at the equipment and instruction given at the School. They did not realize its scope, and everyone went away agreeing to do what they could to improve the calibre of students sent to this School.

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BRILLIANT COLORS POPULAR IN TROPICS

After describing the colorings adopted by the 24th and 78th Pursuit and the 44th Observation Squadrons at Albrook Field, Canal Zone, as distinguishing marks for their planes, and which was described in the last issue of the News Letter, our Correspondent adds that color also seems to please both the natives of Chaume, Republic of Panama, and the cattle that roam about all landing fields in the Republic. He goes on to say that "it was hinted that Chaume would be the base of Wing Operations during the maneuvers in February. Therefore, the 44th Observation Squadron was assigned to fix up the field, and 2nd Lieut. Millard C. Young with the necessary men and tools were flown up to Chaume to level out ant hills, fill in ditches and haul rock from the field. The work completed, numerous red and yellow flags were used to designate the only safe runway in the field. Alas, the color was apparently too much for the natives and cattle, as the stakes are still standing, but Lieut. Young's red and yellow cloth is strangely absent. Some pilots say the cattle look less hungry, but there were numerous red and yellow handkerchiefs in and about Chaume when your correspondent landed there two days later."

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COLD WEATHER TEST OF FLYING EQUIPMENT

During the week ending February 11th, the Winter Test Detachment, organized at Selfridge Field to test the efficiency of airplane cold weather equipment, had such ideal test conditions at their home port that they did not travel north as was planned. For nearly a week the weather was intensely cold and the ground was covered with snow. Engine heaters and starters proved their efficiency or inefficiency in temperatures that went as low as 13 below zero, while the snow on the field enabled skis to be tested on landings and take-offs.

When the weather again turned warm, the Detachment took off for colder climes. On Feb. 14th, the whole Detachment, including five Selfridge Field Pursuit ships and two Bombers from Langley Field, flew to Sault Ste. Marie in northern Michigan, where there is plenty of cold and snow for their purposes. The outfit contemplated staying up north for three days and then return to Selfridge for a short rest before going on a trip to Duluth for some more frigid experiences. The flying personnel of the Detachment includes Major A.H. Gilkeson and 2nd Lieuts. Warburton, Olds, Griswold, Ryan, Bradley, Smith and Hughes.

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PICTURING STUDENT LIFE AT TECHNICAL SCHOOL

The Department of Photography of the Air Corps Technical School, Chanute Field, Rantoul, Ill., has begun a motion picture of the history and experiences of Air Corps, Chanute Field, Recruits, of the student body cadre of the Technical School, from the time they dismount at the Rantoul railroad station or bus terminal until they depart from Chanute Field. This picture will include scenes such as their first entrance through the main gate, the receiving barracks, uniform clothing issue, medical and dental examinations, messing, drills, entrance in school, classroom scenes, inspections, athletics, day room recreation, graduation, and departure of the soldier graduate by airplane for his new station. Though the motion picture has not yet been completed, parts of it were presented at preview to various officers interested, and it promises to be a most interesting and valuable project, worthy in its completed form of extensive circulation.

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LAKE ST. CLAIR ZONED FOR RESCUE PURPOSES

An Operations Memorandum recently issued by the 1st Pursuit Group Headquarters, Selfridge Field, revealed a new rescue system for use in case planes are forced down on Lake St. Clair. The system, which has been devised by Captain R.G. Hoyt, Group Operations Officer, under the direction of Major George H.Brett, the Commanding Officer, provides for ready location and quick relief for occupants of disabled planes on the water.

Maps of Lake St. Clair have been posted in the Post Operations office and the Post boat house on the Lake. These maps have been zoned by lines radiating from Selfridge Field and the zones named after some prominent land mark in each zone.

In case of a forced landing in the Lake, the pilot observing the position of the airplane will get the approximate bearing of the line passing through Selfridge Field and the disabled aircraft. Upon landing, the reporting pilot will immediately determine the zone by referring to the map in Post Operations and report to the Post Operations Officer, who will issue the appropriate orders for employing the amphibian rescue plane or the speedboat.

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FIRE DESTROYS LUKE FIELD HANGAR

For the second time during the last two years, the 23rd Bombardment Squadron was visited by a disastrous fire - January 18th - this time destroying the hangar and the parachute building and causing damage exceeding $100,000. The fire was discovered by Sergeant Vickery while playing baseball on the flying field. He noticed smoke coming from the Parachute Department, and the alarm brought sufficient men out immediately to remove all airplanes from the hangar except one. "This," says the News Letter Correspondent, "was old No. 215 that had been expected to aid us in our camouflage experiments. It required just twelve minutes, after the alarm sounded, to open the doors and drag the other seven planes to safety. Due to the high wind prevailing, it was impossible to combat the fire with any degree of success, it having gotten a good start before being discovered. We give the Navy credit here for such prompt assistance with their fire fighting equipment, and they know how to use it. One man in the Squadron, possibly remembering the fire in 1931, took no chances. Long after all others had left the scene of the fire, he was discovered atop his tent with a "Pyrene," Don't blame him, though, for he had a nice paint job on his shack."

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The following Reserve and National Guard officers recently reported at the Air Corps Technical School, Chanute Field, for a three months' course in Photography:

Captains Gerald V. Kelley, Vincent B.Moore, 1st Lieuts. Reed E. Davis, Joe O. Edge, 2nd Lieuts. John J. Mulvey, John E. Sandow, Air Reserve; 1st Lieut. Frank A. Low, Minnesota National Guard, and 2nd Lieut. Paul N.Flanary of the Tennessee National Guard.

They will pursue this course under the direction of Lieut. George W. Goddard, Director of the Dept. of Photography, and under the special supervision of Lt.James S. Stowell, Instructor in the Department of Photography.

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FIELD ARTILLERY AND THE LOW-FLYING ATTACK

By Major Louis E. Hibbs, Field Artillery

Ed. Note: This article is reprinted from the Field Artillery Journal by special permission of the editor of this publication, Major Dean Hudnutt, F.A., as well as of the author, who, during two different tours of duty, was associated with Air Corps organizations, the first instance at Fort Sill, Okla., when a student at the Field Artillery School and then as an instructor of the Department of Tactics at that institution, and later as a member of the Field Artillery Board at Fort Bragg, N.C., his present station, to which he was assigned following a tour of duty in Hawaii.

Major Hibbs is a graduate of West Point, Class of 1916. After serving overseas during the War when he was wounded in action, he served as aid to Gen. Douglas MacArthur, then Superintendent of the Military Academy. Later he served as Adjutant thereat. He graduated from the Command and General Staff School, Fort Leavenworth, Kansas, in 1927.

THIS article is not intended to open a controversy - to grind any axes or plead any causes; it endeavors to be an impartial examination into a problem which confronts every Field Artilleryman: if not as a burning actuality in these times of peace - when our attention tends to wander off, not unaccountably, into clothing records, gunners' examinations, schools for bakers and cooks and many other kindred channels - at least with startling certainty as a prospect in any future major war. Much of what is contained herein is conjecture; much will be subject to individual differences of opinion, since much is individual opinion; and much will be conclusion reached through theory - not tested - and therefore inconclusive: much of what is written here, however, will afford food for thought and development and herein lies the justification for its writing. It is quite certain that in any future war, large or small, we are going to be attacked by low-flying aircraft; certain at least until we have developed an adequate defense against such attack, and it is with the broad phases of this subject that we herein will concern ourselves.

There are, generally speaking, two classes of air units which are intended for attack of ground troops, a class which operates at high, or moderately high, altitude and a class operating at extremely low altitude in a type of flight characteristically known as "hedge-hopping." This low flying class is known in our service as attack aviation; the individual plane, as the attack plane. It is with defense against this attack aviation that we of the Field Artillery are so vitally concerned.

We may expect to be protected by our own pursuit planes and by our organized anti-aircraft ground units against enemy aircraft operating at high, or moderately high, altitude; indeed such protection necessarily must be undertaken by other agencies, for we cannot expect to man the expensive and extensive means to protect ourselves against this type of aircraft and still be equipped for efficient performance of our battle missions. When, however, we examine the subject of protection against attack aviation we find it a different matter entirely, for the protection which can be afforded by the above agencies against the low flying aircraft, i.e., against attack aviation, is very meagre; it is quite apparent that we must provide our own protection in this case.

In immediate defense against this latter type of attack we may expect little help from our pursuit planes, for pursuit aviation seeks combat at higher elevations where it is better able to utilize its speed and maneuverability. This is particularly true of combat between attack aviation and pursuit, since pursuit, as a type, is generally inferior in armament and needs to utilize in combat the superiority it otherwise possesses in order to make up for this inequality. In passing, it is interesting to note that in combat the probability of the pursuit type of plane's being the victor over the attack type of plane is at present subject to argument, the attack type finding not a few adherents to argue the possibility that it would be the superior. Of course, if this possibility should develop into fact the pursuit type as we know it will probably disappear in favor of the attack type; this, however, is outside of our discussion.

Against planes flying at very low altitudes the larger caliber guns of the anti-aircraft units are practically helpless, due to the possibility of endangering our own ground troops by fire, and due also to the short periods of time during which the planes may be expected to remain in view, appearing now here, and now there - dipping in and out of the folds of the ground. Present equipment for these guns does not contemplate their engaging such targets. We may expect some protection from the small caliber guns of the anti-aircraft units, but these again will be avoided by the enemy when their location is known to him and they will be little better off in action against him than our own small caliber weapons unless (which is not likely) they be placed in our own columns or positions, for in attack of ground troops the attack plane is most vulnerable to fire from the position of the target attacked, as will appear later. So, while we should be grateful for the presence and assistance of these small caliber anti-aircraft installations, we must not count upon them, for there is small probability of their being present in such numbers, or so fortuitously, as to be competent to take over, in its entirety, a responsibility which concerns us so primarily and which we can be, and should be, equipped to handle.

The basic principles under which attack aviation operates against ground troops emphasize the characteristics of surprise action at low altitude, high speed, and a quick getaway. The attack plane seeks the concealment of terrain features until within short range of its target, flying at very low altitude, and attacks at high speed on a single sweep over its target, regaining concealment by terrain features as quickly as possible. Such surprise action heightens the moral effect of the attack upon ground troops and reduces the time available to them for taking cover or, by scattering, to reduce the effectiveness of fire from the plane. In addition, such tactics reduces the possibility of the plane's being shot down by the ground troops by reducing the time available to them for firing on the plane and because the high speed and low altitude of the plane increases its angular speed as viewed from the ground troops' defensive guns, thereby making the plane more difficult to hit.

The advantages resulting from operation according to these basic principles are so marked that we may expect no material departure from them until defensive measures are developed which may be so effective as to make such operation unprofitable: therefore our defensive measures against air attack should be designed to meet attacks so delivered. The weapons to be employed by attack aviation will certainly include both machine guns and bombs and, possibly, chemical agents though the latter, except smoke, are conceived to be more profitably suited to air formations other than the low flying attack. Smoke might find a use in obscuring the at-

tacking planes from the ground in order to reduce the danger from fire of ground weapons. However, it has three aspects disadvantageous to the plane; for it obscures the target, it may cause collision as between planes or between the plane and ground objects, and, since to be effective it should be placed prior to the attack, it reduces the surprise effect; for these reasons its use appears problematical.

One type of our present attack planes carries ten bombs. Of course the complement of bombs is susceptible of increase, but since additional weight cuts down speed and maneuverability a balance will always be struck in such matters. There seems little probability that this number of bombs can be very materially increased without sacrificing maneuverability which can ill be spared; in any event the number of bombs carried will have little effect probably upon the tactics of attack aviation, so for purposes of discussion we may disregard it. The type of bomb to be carried does enter into our discussion since it affects the altitude from which the plane may drop them and thereby does affect the tactics of attack.

Generally speaking, in attack columns on the road or troops in the open, the most effect from machine gun fire from the attack plane will be had when the plane is at very low altitude, for then the fire is the least plunging and, in addition, considerable effect is likely to be had from richochets. At the present time it is understood that developments are under way looking to the production of some type of bomb which will be delayed in either its action, such as delay-fuzed bomb, or in its flight, such as one equipped with a parachute. This development is desired for the purpose of permitting the dropping of bombs from a plane at extremely low altitude and with safety to the plane, because the delayed operation of the bomb will permit the plane to pass beyond the danger range before the bomb detonates. Lack of such a bomb has in the past made it dangerous to the plane to drop bombs at the altitudes which are desirable for machine gun attack and has resulted in the practical necessity of refraining from dropping bombs as a combined attack taking place concurrently with the machine gun attack. This has made it necessary either to seek higher altitudes for the combined attack or for the attack plane to return, after completion of the machine gun attack, and execute its bombing attack at higher altitude. Either of these alternatives has been undesirable; the first reduces the effect of machine gun fire, the second sacrifices surprise effect and re-exposes the plane to fire. The development of this bomb has not been carried to a conclusion, but successful accomplishment of the result may be confidently expected.

Present thought on attack planes equips them with from four to six (and possibly eight) fixed machine guns firing to the front and at least two guns which may be fired at will to the sides and rear, a veritable arsenal! The fixed guns are mounted across the full wing spread of the plane and are so sighted as to sweep a broad path ahead of the plane. The fixed guns at present carry some 300 rounds of ammunition each; when this is exhausted it may not be replaced until the plane lands and is reserviced. With rates of fire of about 700 rounds per minute, the plane has about twenty-six seconds' continuous fire possible from its wing guns. This may seem to be a short period of fire, but it must be recalled that fire will be executed in bursts and that at the speeds with which the plane attacks, these groups of bursts will be of short duration, probably not exceeding five to ten seconds each. In the case of a plane flying 200 miles per hour this amount of ammunition would permit the plane if it so desired, to fire continuously while it swept a stretch of road about 2600 yards long.

Since the attack plane is most likely to come under fire of ground troops at short range, its greatest danger is from fire of small caliber guns. Of these weapons the commonest by far are those of the rifle calibers, approximately caliber .30. It is entirely possible that the vital portions of the plane will be armored to withstand this caliber-even perhaps the armor piercing bullet of this caliber. This addition of armor to the plane will surely be accepted reluctantly by air forces, for it will mean greatly increased weight, but it seems a probable development and it is mentioned here to point out the fact that we may have to go to increased velocities, or larger calibers, or both, in our small caliber anti-aircraft weapons.

Since speed is one of the major requirements of a plane suitable for attack aviation, it is quite certain that such planes will be capable of at least 200 miles per hour and our defensive plans should be based upon that figure as a minimum.

Let us pause for a moment and look at what the attack plane may be when we discover it roaring in on one of our columns:

If it is a two-seater, single-motored plane, either biplane or monoplane, and is equipped with mufflers to cut down its motor roar. It carries armor which is proof against the caliber .30 bullet, protecting its vital points and its occupants from fire directed at the plane from the front, from below, and from the sides. It has an armored shutter for protection of its air-cooled motor while under fire, or has a V-type motor, armor protected, with an armor shutter for periodic protection of its radiator. It carries ten bombs which it may release simultaneously, or in succession, or in any other desired manner. It mounts eight caliber .30 machine guns; two swivel mounted as a pair in the rear cockpit, two on the wing each side of the fuselage and half way out to the wing tip, and two mounted in the landing gear below the reach of the tips of the propeller. These latter six machine guns are fixed guns and are so sighted as to place their cones of fire equally spaced over a front of sixty feet at about 200 yards in front of the plane. In direction the center of their pattern coincides with the center line of the plane. These fixed guns are controlled by aiming the plane, though a portion of them may be set to sweep the ground ahead of the plane even though the plane be flying a course parallel to the ground. There are two advantages sought from this last named arrangement: first, the plane when attacking a column can continue fire with its fixed guns even though it has levelled-off to drop its bombs; second, it affords additional safety to the plane, for if the plane is required to fly straight at its target, it presents itself during this short period of time as a practically stationary target to any machine guns which it is directly approaching. In this case, it is more easily hit than when it is flying parallel to the ground, for then it must be led by a machine gun even though the plane is going to pass directly above the gun.

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As we have said before, attack aviation seeks to attack without warning, strike quickly, and be gone before it can be taken under fire. It relies upon its hedge-hopping flight to afford it immunity from attack by pursuit planes and large caliber anti-aircraft gun fire and to conceal the fact of its presence and its purpose from the target which it is planning to strike.

In wooded country attack planes will have little difficulty in concealing themselves from view of their intended target, particularly if they have any prior knowledge of the terrain over which they are operating. Where the country is open and rolling, their task of concealment will be considerably more dif-

ficult, and, in country which is not only open but which is also flat, such as is found in some of our central states, they will need to be very skillfully led to effect surprise on a vigilant enemy. Their task of effecting surprise on average terrain will not be as easy of accomplishment as casual mention of it may lead us to believe, but unless we are trained in vigilance it will be attained, probably much to our sorrow, and probably when we least expect it.

The attack planes will probably select the nearest cover to the target as the point from which to launch their attack unless, of course, this cover is so situated as to disclose their presence before advantage may be taken of it, or unless more advantage may result to the planes by reason of other considerations, such as attack with the sun behind their backs. Generally speaking, attacks will probably not be initiated from cover more distant than 500 yards, for greater distance exposes the plane for a longer time and at an initial range which is long for maximum effect from their machine guns. When cover close to the target exists, and other considerations do not mitigate against its use, the closest cover will probably be used. The utilization of the closest cover could, of course, be carried to an absurdity by selecting cover which is too close for effective attack; considerations of danger to the plane by reason of the length of time of exposure will always have to be balanced against those relating to effect upon the target.

As a general rule, it seems reasonable to suppose that the greatest danger to us will come from the direction of the closest cover and, when the sun is shining in the early part of the morning and the late part of the afternoon, from the direction of the sun, especially when cover which might easily be utilized lies in that direction.

In practically all cases the attack may be expected to pass directly over the target, for, while the machine gun attack will probably always initiate the action, it is upon bombs that the main reliance for effect will be placed.

The most profitable form of target for attack will be that which may be taken in enfilade. Such a target is best suited for attack by machine gun fire due to the elongated pattern of the gun, and is more easily hit by bombs because of the length of the target. We can count, almost surely, that when we are in a position where enfilade attack is open to selection by the enemy, and other considerations are not of paramount importance, that he will so attack. Of course, where considerations of cover and protection to the plane are at variance with the considerations of target vulnerability, the plane will probably be governed in its actions by the former. That is to say, if, for instance, the only cover permitting surprise action exists on the flank of a column and the column may only be enfiladed by attack from other directions and from which no surprise may be effected, then the attack will probably not be made in enfilade. Or, taking another case, with the sun low in the heavens a battery which is just going into position will probably be attacked from the direction of the sun, regardless of whether the attack is in enfilade or not. It is pertinent here to point out that it is the direction of flight of the plane while attacking, with respect to the direction of the longer axis of the target, which determines whether or not the attack is in enfilade; not necessarily the position, with respect to the target, of the cover from behind which the plane first appears. For example, a column on a road, closely wooded on each side, may easily be attacked in enfilade though the cover is on the flanks, the plane merely coming in over the trees and turning up or down the column.

In enfilade attack, the length of target to be attacked by any one plane, or by a group of planes acting as a unit, will probably be limited to that which can be effectively covered by the bombs carried by the plane, dropped in succession. At the present time opinion seems to be fairly well centered upon a length of 400 yards as being the maximum length which is appropriate for such attack. In the attack of targets of smaller length it seems probable that only the number of bombs necessary for effective coverage will be dropped and the remainder conserved for subsequent use, unless the target is very concentrated and of a high order of importance with a high order of effect desired, in which case a more powerful concentration may be in order.

In attacking a column, a group of three planes will generally attack as a unit; the central plane attacking in enfilade over the column. The remaining two planes, slightly echeloned to the rear, will attack one on each side of the column, the effect from their fire and bombs adjacent to, or overlapping, that of the central plane. This method, even though the column be long, is preferred to a method wherein each plane attacks a portion of the column with all three attacking simultaneously, or the alternative method of each one's attacking the same portion of the column in rapid succession. The latter form of attack of any target is not looked upon with favor because of the loss of the moral effect of surprise action and because of the danger to the planes which follow the leader, by reason of fire from the forewarned ground troops.

What we may expect in the nature of night attack is very much a matter of conjecture. At night there is the ever present danger to the plane from collision with his fellows or with ground objects, even on clear bright nights and illumination provided by flares. This danger will undoubtedly act as a deterrent to attack and, while it will not prevent attack, it is probable that low-flying attack at night will give way to night attacks at greater altitude, in which case the use of machine guns against ground troops may be unprofitable and bombs alone will be used.

We must not be misled by these conjectures into an assumption that we will not be attacked at night; on the contrary it seems most probable that we will be and that these attads will become more and more frequent as our daylight anti-aircraft defensive fires increase in efficiency. If we can make it costly to the enemy to attack by daylight, which is the time when we can best see his planes, he may be expected to make the bulk of his attacks at night - for then our difficulties will be greatly increased with respect to the fire of ground weapons because of the difficulty of seeing the plane - even though the efficiency of attack be lessened because it is made at higher altitude in order to reduce the danger of collision. It also seems probable that except on clear bright nights the use of flares will be common, if not to light the target during attack, at least to disclose its position. This practice will reduce the surprise effect, but its moral effect will be high for it is a nerve-wracking experience to stand conspicuously in the spotlight of a flare and wait for a shower of bombs, especially when the plane is not visible and one stands little chance of even getting a shot at him!

Summing up, it sounds as though it were going to be pretty tough on the ground troops, but there are several things at least from which we may derive some comfort:

In the first place, planes cost money and they are costly to maintain and take time to manufacture; in all probability, therefore, we are not going to be attacked continually by

swarms of planes for there are other, and possibly more profitable, uses for them.

Secondly, after exhausting their bombs and ammunition in attack, it is necessary for planes to return to a base of operations and be reserviced. During these journeys, if they seek altitude the planes will be in danger from our own planes and from our anti-aircraft fire, and, above all, at night must land in illuminated landing fields, which will be, consequently, excellent targets for bombing attacks by our own planes. Here, indeed, is a potential shutting down of their night activity at the source which must not be overlooked.

Thirdly, in the daytime, attack planes may expect to be in continual danger from ground fire. Casual mention of "hedge-hopping" as the accepted method of concealing the attack from the target implies its routine practicability, but it is not going to be easily practicable for the planes, for it must be remembered that in operations involving any large number of troops, all roads throughout an area or all folds in the ground, will probably be occupied by troops, and it will be difficult for planes seeking concealment from their selected target to avoid coming under fire of other units. There is a lesson in this statement which we will do well to record here before we overlook it: all low-flying enemy planes should be attacked wherever they appear unless orders to the contrary have been issued (such as might be necessary in order to avoid disclosure of movements at night, or location of important installations). Certainly, in daylight marches, all columns should endeavor to bring the enemy down whenever he is within range without regard to his actions or intentions. This introduces a problem of identification of our own planes, to avoid taking them under fire - failing a sure and instant means of identification, we might better keep them well off the tree tops than allow the enemy to pass peacefully while we determine his nationality!

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The foregoing discussion has been necessary in order that we may approach the second part of this article with an understanding of what our enemy is going to be, and how, when and where he may be expected to act.

There are three ways in which we may drive off the enemy's attack aviation, or escape the effect of its attacks:

The first is to conceal ourselves from him; a result which will unquestionably be sought to the limit of its capabilities. Unfortunately, moving on roads or across country, even the daylight concealment of foot troops from view of a low-flying plane is a difficult matter; when we come to the problem of concealment of vehicles it becomes well-nigh impossible. At night the concealment problem is not so difficult, but developments in illuminating flares are rapidly making it more so; certainly movement at night on roads which are suspected by the enemy will be difficult of accomplishment without his knowledge if he is determined upon its discovery.

The second way, avoiding the effect of the enemy's fire, is to so spread out our ground troops as to reduce the resulting casualties or, what is better, so as to make attack unprofitable by reason of the thin target presented. Such procedure, after discovery of the enemy's intended attack, is not practicable by reason of the time element, as will be shown later; if the future tactics of attack aviation develop into attacks at night rather than in the daytime, or if they develop into a serious threat against us without any effective counteroffensive measures being possible on our part, then we may find that our movements in the presence of hostile aviation must be made in a scattered formation and not confined to the roads. Such an eventuality seems far-fetched indeed, but is not beyond the realm of possibility, even though it would entail a great loss of mobility and maneuverability and great difficulty in maintaining control.

The third, and by far the most effective way of combating the enemy low-flying attack is to develop our anti-aircraft fire, or other offensive means, so as to make this form of attack unprofitable to the enemy.

If we can bring down enough of the enemy's planes to make it a definite menace to him to come sweeping in over us at very low altitude it may be expected to result in his abandoning the low-flying attack during daylight in favor of higher altitude where he must content himself with bombing, and where he is reasonably safe from the fire of small calibers. Driving him up into the air will result in: (a) reduction of his accuracy in bombing; (b) increased danger of attack of his planes by our own planes; (c) an opportunity for the employment of our larger caliber anti-aircraft guns against him; (d) loss to him of the surprise and moral effect of low-flying attack; (e) increased chances of our troops' not being discovered, thereby escaping attack.

Of these three* methods of combating the attack aviation, the first mentioned, that of concealment, is almost impossible; the second, that of presenting a thin target only, should be considered in the light of a last resort, for it entails making great sacrifices in mobility and control and accepting the lesser of two evils on account of the number of casualties we would otherwise suffer. (Of course, we will unquestionably utilize certain formations which partake of the "scattered target" type; what is referred to here as a last resort is the habitual departure from formations on roads and the movement of all troops across country on broad fronts.) The third method, that of driving the enemy up into the air, is the one to which we should look. It will undoubtedly require equipment which we do not now possess and probably intense study and development, with possible sacrifices in added weight and equipment. If, however, we must make sacrifices to obtain immunity from this type of attack then there is no alternative.

While we speak thus of immunity from this low-flying attack, we must take it with a grain of salt, for obviously there will arise tactical situations where the results obtained from such attack, even though the casualties in planes be large, will justify their being carried out. Such situations may, for example, arise in the need for delaying pursuit or retreat and will probably occur in such critical stages of actions. Our immunity to this form of attack, granting that we may secure it, will therefore only apply to the usual run of operations; even if there secured, it will be necessary for us to be continually vigilant in order to retain it.

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Field artillery is most vulnerable to attack in its animals. The horse is a large target and is amazingly easily put out of action by shell fragments, especially when struck in the barrel; in addition he is extremely susceptible to being stampeded and readily injures himself when running blindly in a terrorized state. Thus we may say without fear of contradiction that the most vulnerable target which Field Artillery presents to the attack plane is a horse-drawn unit in column on the road; next in order of vulnerability are those formations or installations where the animals are grouped as a more or less concentrated target - horse-drawn batteries going into or

*A fourth method of combating the attack, i.e., that of utilizing armor for protection, is not discussed here for reasons of weight and impracticability, though its use does appear later in special forms.

out of action, horse-lines or limber positions exposed to attack, large groups of mounted men, etc. The crippling of the animals of a Field Artillery unit may be more effective, and a much more costly loss to us in battle efficiency, than an equal percentage of losses in personnel. This may sound like a cold blooded "cannon-fodder" statement but it is basically true: two men from a gun crew of nine may fire the piece and later even serve as drivers, but a gun team of one pair is inadequate to handle the carriage except in the easiest sort of going.

Here, by way of not glossing over an unwelcome truth, let us pause to note that in this matter of vulnerability of animals lies another cogent reason for adoption of motor transport for future artillery use. Truly, if "a battery seen is a battery lost" (and this saying implies "lost by reason of the enemy's artillery fire"), how much more applicable may it be to a horse drawn unit caught in column on the road by a flight of attack planes? If requires little imagination to picture the result. Even supposing that no casualties result from the attack, there must certainly be a demoralizing disorganization which it will take many minutes to rectify - and who can fancy a situation where no casualties will have resulted when all of our drivers, our mounted men, and our animals, have been completely exposed to the fire and to accident attendant upon the stampede of such teams as become terrified by the gun fire and bombs - both our own and the enemy's? (This is not a wildly imaginative picture conjured up for effect, such as appear in press and print devoted to sensationalism, but arises from a sad conviction of certainty supported by experience of fire far less potentially effective than we may expect from a flight of attack planes.) On the other hand we may armor the vital parts of motors, and, when attacked the personnel may seek what little cover they can take in the short time available to them.

To return to our discussion, we may place next in order of vulnerability of units, those which are motor-drawn, in the order; columns, and concentrated targets where personnel is also present. Batteries in position are considered to be of a low order of vulnerability when shelter has been provided for personnel. If attack by planes is a common procedure of the enemy small trenches to shelter personnel of the gun crews will appear as if by magic upon occupation of the position and without materially cutting down the efficiency of the fire of the battery. Once having provided pits to shelter personnel a battery in position cannot be classed as a very vulnerable target for attack.

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To be concluded in next issue.

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RANDOLPH HOLDS FIRST REUNION

In response to an invitation extended by the Flying Cadet Battalion to all officers who had received flying training since September, 1922, over 400 airmen gathered in the spacious Flying Cadet Mess Hall on the evening of February 21st and pledged their enthusiastic support to the further crystalization of class esprit and Air Corps tradition.

Among the distinguished officers whose presence made this meeting of primary importance to the Air Corps were General Danforth, Commanding General of the Air Corps Training Center; Colonel Clagett, Commandant of the Air Corps Advanced Flying School; Major Martin, Commandant of the Air Corps Primary Flying School; Colonels Harwood, Clark, Majors Lackland and Miller.

In a short introductory address, Lieut. Griffiss outlined the purpose of the gathering and urged graduates and undergraduates to "Keep alive the flying days of yesterday," pointing out that this could be done by "Giving our whole-hearted support to the Flying Cadets in their endeavor to develop Class Esprit and Air Corps Tradition." Major Martin spoke concerning the work of training fundamentally sound flyers at the post under his command. Col. Clagett outlined the program carried on at Kelly Field during the advanced stage of training the military pilot; and Major Lackland, Commanding Officer of Brooks Field, gave an outline of the duties of a tactical unit, thus summing up the three stages of advance from dodo to junior officer.

In discussing the serious question of air discipline, General Danforth urged the large gathering of flyers, and the Flying Cadets in particular, "Never take any foolish chances. No matter where you are, where you are assigned, or how "hot" you get, remember there are hazards enough incidental to flying.....and that an accident can happen to you the same as to Tom, Dick or Harry."

Tables were arranged according to classes since the beginning of the present training system, and there were few classes which were not represented by men who had taken the course as Flying Cadets and graduated into the world of military flying. The Cattlet and Williams trophies were awarded to Flying Cadets League and Eskridge for meritorious military and athletic service, respectively; and Flying Cadet Brown received thanks from Lieut. Griffiss, representing the graduate and undergraduate bodies, for conceiving the idea and writing the words for the song "Sons of Randolph," which is henceforth to be the official song of the Flying Cadet Battalion.

From the Fresh Crab cocktail which opened the meal to the coffee and cigars which marked its close, the banquet was tasty and well served, with absolute minimum of delay due to the large number of guests.

Beside each place was placed a copy of the Air Corps Primary School roster, a small blue booklet containing the record of every man who enrolled in the primary schools at Brooks Field, March Field or Randolph Field. Many thousand names, as well as exhaustive statistical studies by class and group, made this publication one of the chief sources of interest throughout the evening. Flying Cadets were interested in looking up their instructors and friends, while the older members of the group were perhaps turning back the pages of time as they found names of former classmates. The importance of this booklet, published at a time when all minds were turned toward the problem of bringing shape and form to Air Corps tradition, is inestimable. It is a starting point from which all future records must be reckoned.

An amusing program, composed of skits and songs, followed the speeches. The skits were played by Flying Cadets, while the songs were sung by the entire body. Flying Cadets Kruse, Altenburg and Dunahoo were outstanding with their skit in which General Danforth, Major Martin and Captain Cannon were represented in pantomime and treated summarily in the spirit of fun which prevailed.

The first class reunion of past and present students of the Air Corps Training Center was a tremendous success. The date of future reunions will be October twelfth of each year, and on that date it is hoped all former students, whether graduated or not, whether Flying Cadets, Student Officers, Training in Grade, or Foreign students will again gather with fellow classmates to fly over again the old days on Primary, Basic and Advanced Stages and experience that heartening sense of belonging in fact or in spirit to that great body of fine men, the Air Corps.

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Ma, what does Pa mean by a streamlined model? I don't know, son, but if it's what I think - he better look out.

WINTER TEST DETACHMENT RETURNS FROM THE NORTH

Eight pilots and planes, under the command of Major Adlai H. Gilkeson, recently returned to their home station at Selfridge Field, Mich. from a three-day excursion into the land of lower temperatures. "Sault Ste. Marie isn't the most northerly point in our country, but isn't far short of it," says the News Letter Correspondent, "so there Army planes were routed to the 'Soo' as the location for their winter testing.

'The Winter Test Detachment,' as the eight pilots and planes and their mechanics are called, is the result of recent developments in cold weather flying material. The Army has developed numerous devices for starting motors in extremely cold weather, experimented in new and lighter oils for cold flying and has developed several kinds of skis for use in dense snow. None of these developments can be tested thoroughly at existing Army fields, so it became necessary to seek colder climates and deeper snow. The expedition consisted of one P-12E, one P-12F, one P-12C, one P-6E and one P-16 two seater Pursuit, two B-6 Bombers from Langley Field, and one Ford Transport. All ships were equipped with some kind of skis except the Ford and one Bomber.

Very excellent weather conditions for preparatory tests were encountered at Selfridge Field for several days previous to departure. The temperature dropped to a low of -13F and stayed around zero for three days. The planes were staked down outside the hangars and each day attempts at starting were made. On the first morning very poor results were obtained, due to the crew's inexperience in starting very cold motors and to the fact that they had not become sufficiently acquainted with the oil burning heaters used in warming up the motors. Before the expedition set out, however, it had become quite efficient at starting and no motor required more than half an hour's heat and cranking to start perfectly. The flight to Sault Ste. Marie was without any unusual event. Landing was accomplished without mishap and a foot of snow was found on the field. The planes were staked down and covered (there is no hangar at the airport) and left under guard for the night. The following day the weather was slightly disappointing, being only five above. In fact, the temperature during the three days never went much below zero. All motors were started within half an hour the following morning, and numerous test flights were carried out. The Bomber with three skis found it impossible even to taxi. The texture of the snow seemed to have changed during the night and great quantities were frozen to the skis. It was soon found that in parking skis for the night, straw or planking should be placed between ski and snow to prevent freezing. All machine guns were found to function satisfactorily, but a lighter grade oil for their moving parts was found necessary.

Several of the pilots visited the Headquarters of the Provincial Flying Services, Inc., located at Sault Ste. Marie, Canada. There we learned that our little cold weather experimenting was mere child's play - we were shown flight reports where the temperature varied between thirty and fifty three below for an entire week. An interesting story was told of one Canadian pilot who was forced down a thousand miles in the interior and whose propeller was smashed in landing. The pilot and his mechanic set to work, and within six weeks they killed a Caribou, made glue and fashioned a wood propeller from an old ski which they carried. The Winter Test Detachment expects to make a flight to Duluth very shortly and is hoping to find deeper snow and lower temperatures."

The frozen north is not so frozen, according to tales brought back by members of the Winter Test Detachment, who have just returned from a ten-day stay at Duluth, Minn., where they have been testing newly developed cold weather oil, engine starters, engine warmers, and ski landing gears. The officers and men of the Detachment admitted the temperature was pretty low in that latitude, but the warmth of the Duluth hospitality made up for the coldness of the weather. The days were filled with hard work and hard flying, many flights being made to altitude where minus 40 temperatures could be found and many landings being made on the snow covered airport. The mechanics worked fast and furiously repairing damaged equipment and starting engines that had been purposely left outdoors for many hours in sub-zero temperatures. But the good people of Duluth made sure that the evenings furnished relaxation from the day's work of the pilots and mechanics. Major Lyman, Corps of Engineers, who is stationed at Duluth, made sure that no one lacked for entertainment, and he helped organize many parties and introduced the military men to the civilian population.

Official reports as to the work accomplished by the Winter Test Detachment are now being made out. The Detachment will be disbanded shortly. Major Adlai H. Gilkeson, Commanding the Detachment, hopes, however, that the outfit will be reorganized next winter for tests farther afield. He believes that real and final data can only be obtained by operating in Alaska, where the ultimate in winter weather conditions can be encountered.

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ORGANIZATION OF TRANSPORT SQUADRONS

Pursuant to instructions received from the Chief of the Air Corps Materiel Division, the 2nd Provisional Air Transport Squadron was constituted at the San Antonio Air Depot, Duncan Field, Texas, with the station Operations Officer as the Commanding Officer and Operations Officer thereof, the remainder of its personnel to be such enlisted pilots as may be assigned to the Depot for general transport duty. This is one of the provisional squadrons constituted at each of the continental Air Depots as a part of the First Provisional Air Transport Group, to be considered as a provisional and embryonic organization, under the new Air Corps policy looking to the establishment of such a Group with the basic function of supplying tactical organizations in the field, and the further function of transporting supplies from the Depots to stations in their Control Areas.

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SOLDIER BECOMES COLLEGIATE

"Much newspaper publicity, both pro and con," says the News Letter Correspondent, "has been given to the public question of whether Chanute Field and the Air Corps Technical School will be retained at Rantoul, or moved to another location. The Chanute Field Correspondent feels unable to express his personal opinion in this debate, even though he elected to do so. However, there has only recently appeared one decided advantage of retention of the school so near to Champaign-Urbana, the seat of the University of Illinois. The cultural value to soldiers of this close association with one of the foremost educational institutions of the nation was strikingly set forth a short time ago, when a recruit was called to account for a minor infraction of standing orders. He was instructed to report to Captain Walter Bender, the Commanding Officer of the Air Corps Technical School Detachment, which consists of several hundred soldiers. After carefully

checking over his new brass buttons and straightening his belt, he knocked on the Detachment Commander's door and, with a manly effort at a salute, he bravely announced, 'Sir, I am here to see the Dean of Men!'"

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THE ANNUAL MANEUVERS IN PANAMA

Reports on the annual maneuvers in the Panama Canal Zone were received both from France Field and Albrook Field. The France Field Correspondent goes on to say that the part played by the Air Corps in the annual maneuvers this year was not as extensive as in the last few years previous. The maneuvers this year were divided into three periods; the first being devoted to anti-aircraft defense, the second to maneuvers individually by the Atlantic and Pacific sectors, and the third period to combined maneuvers of the Atlantic and Pacific Sector troops in the Chame area.

During the first period approximately 15 anti-aircraft intelligence stations were established on each side of the divide and all were in telephone or radio contact with anti-aircraft Headquarters. In order to test out the efficiency of this system, the 25th Bombardment Squadron simulated a hostile attacking force and launched an attack on the Canal from David. The Canal was defended by two Pursuit Squadrons and two Observation Squadrons. The attackers' position was located and followed accurately enough to warn Pursuit, and an interception was made about 15 miles from Gatun - the Bombers' objective. Night attacks on the Canal by Bombardment were also simulated during this period for the cooperation with the anti-aircraft searchlights. The Navy Bombers and Torpedo planes also launched two attacks against the Canal which were not intercepted.

During the second period the Atlantic Sector troops proceeded through the jungles toward Porto Bello and the air units were only called upon for a few liaison missions.

The last period saw the combined forces of the Atlantic and Pacific Sector in a stand against an imaginary enemy which was advancing toward the Canal from the west along the National Highway. All troops went into action near Chame. During the withdrawal from this area a situation was assumed in which the enemy was attempting to establish a beach head near Chorrera and the air force was called upon to transport a battalion of mountain artillery from Chame to a position where it could harass the enemy. The 25th Bombardment Squadron in two trips transported all the equipment for the battalion and 80 men. The 7th Observation Squadron transported 18 additional men. For this movement close protection was given to the Squadron by the two Pursuit squadrons of the 16th Pursuit Group at Albrook Field. When the artillery were in position, the Air Corps passed in review over the guns amid the roar of blank ammunition and the clicking of cameras.

The last day of the maneuvers was occupied by a review by the Department Commander of all the troops on the Isthmus at Albrook Field. Considerable difficulty was experienced by the 25th Bombardment Squadron when the parking position for the airplanes was designated in a part of the field which had never been used previously. Three planes sank to their axles in the soft earth and two more went up on their noses. The damage, however, was slight. After all foot and mounted troops had passed in review, the air units cleared the field and also passed in review - the largest aerial review in the history of the Army in Panama, with 13 Bombers, 18 Observation and 30 Pursuit airplanes.

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"The month of February was indeed a busy one for Albrook Field," says the News Letter Correspondent from this new Air Corps activity in the Canal Zone. "Maneuvers began in early February and terminated with a splendid review of all Departmental ground and aerial forces. The review took place at Albrook Field on what is termed, rather sarcastically, our aquarium - the flying field.

Early in February, France Field intrepid bombers, simulating an attack of enemy planes from an aircraft carrier, flew up country as far as David, from there launching their bombing raid. Their presence and progress was reported by various Anti-Aircraft Intelligence Service outposts and by the 44th and 7th Observation screen. The bombers were sighted by the Observation screen around Penonome, and Albrook Field ground station was immediately radioed, giving the place, altitude and time the attackers were sighted, and their course. The bombers turned from Penonome into the area patrolled by the 7th Observation Squadron from France Field. The 16th Pursuit Group from Albrook Field notified of the presence of the bombers and their course, immediately took off and intercepted the bombers about 15 miles from the bombing objective. There a spirited attack took place, wherein the 16th Pursuit Group dispatched the bombers, or the bombers dispatched the pursuit, according to whom you are speaking, a pursuiter or a bomber.

The second and most successful bombing raid occurred a few days later, with the aid of the Navy. The Navy sent a number of bombers, about twelve in all, to bomb and render useless the Panama Canal. The Navy planes divided their forces and attacked from two directions. They had a rather clever idea of decoying the protective air force with a few ships, then attacking the canal with the remainder. It worked like a charm. The canal was attacked simultaneously at San Miguel and Gatun Locks. The Navy deserves a great deal of credit for this successful raid. It was carefully and wisely planned and precisely executed. They took every advantage of the cloudy weather conditions and lack of coastal and inland Anti-Aircraft Intelligence Service Stations.

The climax of the maneuvers for the Air Corps occurred on February 22nd. An advanced airdrome had been established February 12th at La Chorrera by the 44th Observation Squadron. The entire aerial force of the Canal Zone was moved into their capacious field on February 22nd. The ground troops were intrenched in the Chame area simulating a defense against a superior attacking force. An enemy vessel, simulated, was preparing to land a force, also simulated, on the beach (not simulated) opposite La Chorrera, for the purpose of destroying the Naval defenses at Farfan Point, and possibly to cut the lines of communication from the Chame area to the Canal Zone. There was immediate need of opposing and prohibiting this landing. The open-mouthed natives were treated to the scene of aircraft taking off in droves and flocks, and heading for the Chame area. The France Field bombers and the 7th Observation Squadron, given close protection by the 16th Pursuit Group, flew to Chame and there the bombers and observation planes loaded a battery of 3-inch mountain guns, complete with personnel (except mules). They then flew to La Chorrera, where the battery was rapidly put into action, serving shrapnel (simulated) a la carte to the simulated landing party. The whole undertaking was a complete success, no casualties except a few sea-sick artillery passengers.

Captain Ott, in command of France Field's bombardment squadron, fell into a neat trap concocted by nature, aided and abetted by the Constructing Quartermaster Corps, U.S. Army. On February 23rd, while parking his ships, pre-

paratory to the aerial review, six out of his thirteen bombers either sank quickly to the axle or buried their noses in the sand. From a distance it looked very much like scattered and broken toys strewn by some bored childish hand. To Captain Ott's credit, every ship partook in the review the following day.

The maneuvers were terminated on February 24th, with a review as diversified as it was impressive. Marching troops, mounted troops, pack mules, trucks, caissons, wagons and tanks-splendid in discipline, moved all in exact formation. Topped with an aerial review of unusual brilliance, it was a sight to thrill even the oldest 'Top Sarge.'

This terminated the review and Albrook Field moves into the month of March, confronted with the problem of beautifying the post before the start of the rainy season."

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SUDDEN LURCHING OF PLANE RESULTS IN TRAGEDY

A strange tragedy occurred at March Field, Riverside, Calif., on Feb. 26th, resulting in the death of Sergeant Vincent Maillo, 11th Bombardment Squadron. As this Squadron circled March Field preparatory to landing, following a night flight from Tucson, Ariz., the plane in which Sergeant Maillo was riding as co-pilot suddenly lurched out of control. The pilot instinctively pushed forward on the wheel, diving out of the formation to prevent collision with the other planes. As he did so, Sergeant Maillo was thrown from his seat and hurled against the center section struts of the plane. He lay there apparently unconscious for a moment as the pilot recovered control of the plane and attempted to reach him and pull him back to safety, but he was out of reach, and before anything could be done to help him, was blown off, disappearing in the darkness. Two other members of the crew, Privates Otto G. Glass and Hartley E. Roberts, seeing Maillo leave the plane, believed that an emergency existed and took to their parachutes. The plane was landed safely and the pilot immediately reported the story. A few minutes later, Roberts limped into the Squadron Operations Office with a sprained ankle, and Glass came in with a severe cut over one eye, which may result in further complications. A search was started by all available personnel of March Field, the territory adjacent to the field being lighted by flares, automobile headlights and flashlights. The lifeless body of Sergeant Maillo was found some three hours later. His ripcord had never been pulled.

Sergeant Maillo was born in Naples, Italy, in 1886. He joined the Army in 1914, serving with the 56th Coast Artillery, the 64th Coast Artillery, the 61st Service Squadron, 4th Observation and 11th Bombardment Squadrons, Air Corps. He is survived by a sister, Mrs. Anna Enrico, who has not been located at this time.

This accident marks the first casualty from flying causes that the 11th Bombardment Squadron has had since its re-constitution on the active list in 1928.

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The strength return of the 73rd Pursuit Squadron was increased recently when there was an addition to the roster "Little Willie," six-months old cub bear, which was procured at Tucson, Ariz. and transferred to March Field by air when the Wing returned from its training flight to Arizona. The new mascot is a particularly appropriate addition to the organization, because the 73rd first became an active unit in the Air Corps in the State of California and adopted as its insignia the State of California bear.

What kept you from sleeping on the airliner? The buzz of the wasps and hornets.

FAMOUS SCIENTIST VISITS MARCH FIELD

The internationally known scientist, Prof. Auguste Piccard, who holds the world's altitude record of ten and one-third miles, visited March Field on Feb. 28th and was shown the activities on the post. During the evening, he delivered a lecture in Riverside, illustrating his remarks with slides. Prof. Piccard stated that the purpose of his experiment last summer was to study the mysterious cosmic rays which present one of the most interesting of the unsolved mysteries of science.

In connection with this study of the cosmic rays, March Field recently performed its second series of experiments in cooperation with Doctors Robert A. Millikan and Victor Neher, of the California Institute of Technology, who are recognized as leaders in this field of research. A Pursuit plane, flown by 2nd Lieut. Carl Murray, 73rd Pursuit Squadron, carried the scientific instruments to an altitude of 25,000 feet where records were made of the activity of this illusive ray. Through such experiments as these in various parts of Canada, United States, Mexico, Central and South America, these two scientists have assembled a mass of data which they believe is destined to throw a considerable amount of new light on this important study. The flights at March Field, however, have been made at greater altitudes than similar airplane flights made for this purpose in other parts of the world.

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OBS. PLANE SERVES AS AMBULANCE IN EMERGENCY

In answer to a call for a mercy mission from the Engineer Corps operating near Aguadulce, Republic of Panama, Lieut. W.G. Benn, Air Reserve, 7th Observation Squadron, recently took off from France Field in a Thomas-Morse O-19C airplane and covered the 85 miles to Aguadulce in 35 minutes. However, he found that his patient, a soldier of the Engineer Corps, stricken with appendicitis, was not able to sit up in the rear seat as had been expected.

Necessity is the mother of invention, for by removing the back of the seat, swinging the seat itself against the side of the airplane, removing the box for the radio transmitter which is located behind the seat, plenty of room was afforded wherein the patient could lie down. Stowing all extra flying equipment, transmitter box and seat back into the rear of the fuselage, a mattress was laid down on the floor of the plane, making a comfortable bed.

Two men straddled the fuselage, one in front of and the other behind the rear cockpit facing each other and, with the aid of two men on the ground, the patient was lifted up and lowered on the mattress in the bottom of the plane. His head was placed immediately behind the control stick socket, and he had more than sufficient room to stretch out, making a very comfortable bed in this emergency. By cutting the lacing of the canvas between the two cockpits, Lieut. Benn was able to watch his patient en-route.

The 78 miles to Albrook Field was covered in 45 minutes. Here the plane was met by an ambulance which took the patient to the hospital for the necessary operation. Personnel of France Field hope that this information may be of value to other members of the Air Corps.

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Captain D.M. Reeves, Chief of the Technical Data Section, Materiel Division, Wright Field, spent several weeks at Cambridge, Mass., delivering a course of lectures on aerial photography before the Institute of Geographical Exploration of Harvard University. Capt. Bruce Hill left for Cambridge recently to give a continuing series in the same course. He will discourse on Theoretic Bases for Photographic Mapping.

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TRANSFORMATION OF CHANUTE FIELD CHAPEL

Through the ingenious efforts of Major Milton O. Beebe, Post Chaplain, and the cooperation of the Commanding Officer, Department Heads, and the ladies of the post, the Chanute Field Chapel has been changed from a mere barn-like shack with an unsightly interior to an attractive little church with accouterments proper to its dignity as an Air Corps Chapel.

Chaplain Beebe, with unusual ability to find bargains, arranged to buy, within the limits of his small Chaplain's Fund, a set of theatre chairs, and around these he has built his new chapel interior. The woodworkers of the Department of Mechanics, Air Corps Technical School, donated their own time and built a handsome walnut altar which has called forth many compliments as a work of art, with its beautiful matched panneling and raised scriptural lettering of serrated design, carved from walnut blocks. Post carpenters built chancel and altar platforms, a chancel rail, a lecturn and a choir loft. Altar hangings are of royal blue velvet, while window draperies are of neutral gray course-weave material. Aisle and chancel runners are of pleasing gray carpet.

One of the most notable additions to the chapel is Major Beebe's much discussed "Flying Organ," which was received by him in Chicago as a gift to Chanute Field several weeks ago, and which was flown to Chanute Field in the cabin of an air transport, merrily broadcasting its musical creed at the touch of a soldier organist while in flight to its new home at Chanute Field. As a supplement to the bugle in church calls, an officer of the post donated an antique bell, which it is expected will be installed in a small belfry.

The seating capacity of the chapel now accommodates 125 persons, with possible expansion to 150. "Chanute Field," says the News Letter Correspondent, "is to be congratulated upon this new attractive chapel rearrangement, as well as having on its roster Major Beebe, who now states he is ready in proper style for services, weddings, christenings, and other activities of his official and personal range of action."

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NEW INSIGNIA FOR 7TH BOMBARDMENT GROUP

A new insignia to be worn on the uniforms of officers and enlisted men has been designed by the 7th Bombardment Group, March Field, Calif. and approved for use by the Secretary of War. It consists of a shield, crest and motto of the coat of arms of the 7th Bombardment Group. It will be manufactured in bright metal and enamel in one size, not larger than 1½ inches in height. The motto "Mors ab alto" meaning "death from above," the shield of azure and a crest on a wreath of colors with a bomb paleways sable piercing a cloud proper are the distinctive features of the design.

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The transfer of Major F.H. Coleman to Patterson Field as Commanding Officer left the Equipment Branch of the Materiel Division without a chief. It was with regret that the members of this Branch saw Major Coleman depart, for he has shown great interest in the projects of each of the units and had been active in forwarding their development. Major E.L.Hoffman succeeds Major Coleman as new Acting Chief of the Equipment Branch, though at present he is on leave in California. Major Hoffman has been associated with the Equipment Branch for many years as Chief of the Parachute Unit and is acknowledged as one of the foremost parachute authorities in the world.

WAR DEPARTMENT ORDERS

CHANGES OF STATION: To Office of the Chief of the Air Corps: Lieut.-Colonel Walter R. Weaver upon completion present course of instruction at Army Industrial College; Capts. George C. Kenney and David S. Seaton upon completion of present course at Army War College.

To March Field, Calif.: Major Eugene A. Lohman from Panama;

To Patterson Field, Ohio: Major Fred H. Coleman from Materiel Division, Wright Field.

To Langley Field, Va.: Lieut.-Col. Albert L. Sneed from Fairfield Air Depot, Patterson Field.

To Crissy Field, Calif.: 1st Lieut. Fred A. Ingalls from Hawaii.

To Washington, D.C.: Major Ralph P. Cousins to Militia Bureau upon completion of course at Command and General Staff School, Ft. Leavenworth

To Mitchel Field, N.Y.: Major Follett Bradley upon completion of course at Naval War College Newport, R.I.

To Fort Riley, Kans.: Major Rosenham Beam upon completion of course of instruction at Command and General Staff, for duty as instructor at Cavalry School.

To Maxwell Field, Ala.: Captain Grandison Gardner and 1st Lt. Warren R. Carter for duty on staff and faculty of Air Corps Tactical School upon completion of course of instructio at this school.

RELIEVED FROM DETAIL TO AIR CORPS: 2nd Lt. Kenneth F. Zitzman to Signal Corps, 2nd Division, Fort Sam Houston, Texas; 2nd Lt. Samuel A. Daniel to 2nd Infantry, Fort Wayne, Mich.; 2nd Lt. James L. Massey to Infantry, 2nd Div., Fort Francis E. Warren, Wyoming; 2nd Lt. Robert F. Moore to 6th Coast Artillery, Ft. Winfield Scott, Calif.; 2nd Lt. Arville W. Gillette to Infantry, 2nd Div., Fort Sam Houston, Texas; 2d Lt. Julian D. Abell, Corps Engineers, to Detroit, Mich., as Assistant to District Engr.

DETAILED TO AIR CORPS, and to Randolph Field Texas, for primary flying training: 2nd Lieut. Graves C. Teller, Infantry.

PROMOTIONS: To Lieut.-Colonel: Majors John N. Reynolds, Robert Coker, rank Jan.1, 1933; Major Frank M. Kennedy, March 1, 1933; To Capt 1st Lts. Guy L. McNeil, Dec. 18, 1932; Clarence P. Talbott, Alfred L. Jewett, Louie C.Mallory, Lewis S. Webster, Jan. 1, 1933; Roy W. Camblin Jan. 14,1933; Cornelius J. Kenney, Feb.1,1933; Winfield S. Hamlin, Feb. 21,1933; Robert T. Zane, March 1, 1933.- To 1st Lieut.: 2nd Lieut Maurice F. Daly, Jan. 1,1933; Laurence S.Kuter Jan. 25, 1933; George McCoy, Jr., Feb.21,1933; Julius T. Flock, March 1, 1933.

RETIREMENT: Master Sgt. Frank Krick, Chapman Field, Miami, Fla., March 31,1933, with rank of 2nd Lieutenant.

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NEW OBSERVATION PLANE AT MATERIEL DIVISION

A new Observation airplane, known as the O-43, arrived recently at Wright Field from the plant of the manufacturer for flight testing. A high wing monoplane with metal monocoque fuselage, the O-43 incorporates improvements over an earlier Observation type rather than any radical new design features of its own. The principal changes are the substituti of a cantilever landing gear strut type of the earlier airplane and the replacement of the stubs of the gull wing by a straight center sec tion. The wing retains the parasol feature. The change in the center section is for the purpose of providing better landing vision for the pilot. The rear cockpit has been enlarged and made deeper. A streamlined glass windshie offers protection for pilot and observer. The airplane was constructed by the Douglas Co., an power is furnished by a Curtiss Conqueror moto

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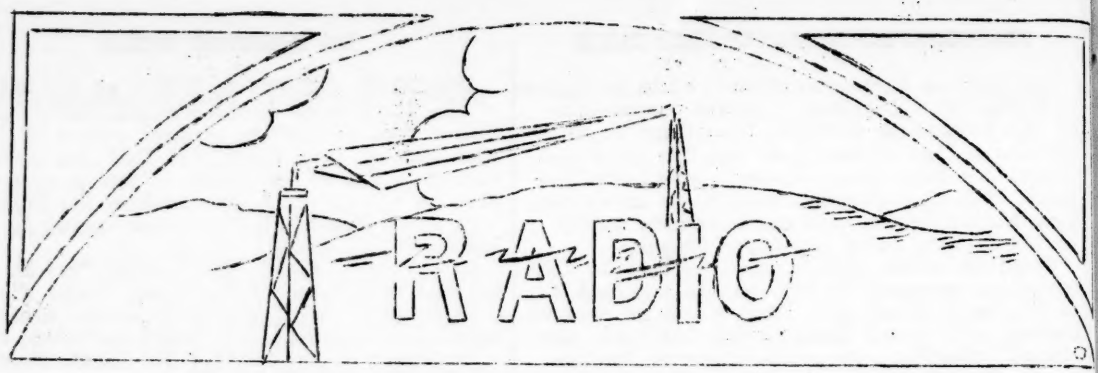

An exceptional student graduated recently from the course for Radio Mechanics and Operators, Air Corps Technical School, Chanute Field, Rantoul, Ill., Private Victor H. Bardon, 5th Observation Squadron, Mitchel Field, N.Y. This student, a fine soldier, has, in radio code reception, in a three-minute test, closely approached the world's record, with a speed of 56 words per minute without error. In addition to this, he types regularly at the rate of 95 words per minute, and has attained to a maximum speed of 135 words per minute. Private Bardon's academic record has resulted in the high final average of 89.43 percent, and the Department of Communications of the School takes much pride in graduating a student of this caliber.

Considerable work and experimentation was completed by 1st Lieut. La Gue, Communications Officer, and 1st Lieut. Raymond Wilson, Engineering Officer, 120th Observation Squadron, Colorado National Guard, on the building and installation of a successful radio receiver for airways beacon, to be used in connection with blind flying. The finished product weighs but seven pounds; has one tuning dial, one volume control dial, and requires an antenna of only six feet. The antenna extends from a mast, about 3 feet above the fuselage, situated at the rear of the rear cockpit. "There is great enthusiasm among the officers on the success of the receiver," says the News Letter Correspondent, "and we extend to Lieut. La Gue our compliments. We think the receiver is far superior to any receiver on the market which may be purchased at a reasonable figure."

Lieuts. H.W. Ferguson and H.A. Craig left Randolph Field, Texas, recently for a combination extended avigation flight and to test radio equipment. The ship was equipped with a short wave set recently furnished to the Signal Corps, and during the flight expected to test out this set with the Department of Commerce radio broadcasts. Their itinerary takes them from Randolph Field to El Paso, Texas; El Paso-Rockwell Field, Calif.; Rockwell Field-March Field; March Field-Santa Monica; Santa Monica-March Field; March Field-Crissy Field, San Francisco; Crissy Field-Pearson Field, Washington; Pearson Field-Seattle; Seattle-Pearson Field; Pearson Field-Crissy Field; Crissy Field-March Field; March Field-Amarillo; Amarillo-Dallas; Dallas-Randolph Field.

Major George H. Brett, Commander of the 1st Pursuit Group of Selfridge Field, Mich., accompanied by the Group Operations Officer, Capt. Ross G. Hoyt, flew to Louisville, Ky., on Feb. 16th to attend a conference of officers of the 5th Corps Area. The conference, which lasted for several days, had as its purpose the making of tentative plans for the conduct of the Joint Anti-Aircraft - Air Corps Exercises to be held in the vicinity of Camp Knox during April and May. An interesting feature of this air trip was a radio test conducted by Capt. Hoyt during the flight. With a type R-AA-183 sending and receiving set in his P-6E Pursuit plane, he maintained constant radio telegraphic communication with his home station until he landed at Bowman Field, Louisville, 350 miles away.

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WELL KNOWN AIR CORPS EMPLOYE PASSES AWAY

The death recently of Colonel Overton C. Pierce, who was on duty in the Personnel Division of the Office of the Chief of the Air Corps, is mourned by his many friends and acquaintances among officers and civilians. Word of his death came as a distinct shock, since he was at his desk only the day before.

Colonel Pierce, who was 66 years of age, was a resident of Washington for a good many years. He was born at Lancaster, Ky., April 12, 1886. He attended the graded schools at Lancaster, from 1871 to 1880, and thereafter the Lancaster Academy for two years and Center College, Ky., for a similar period. He served slightly over eight years as an enlisted man in the U.S. Infantry, his last enlistment being during the period of the Spanish-American War. Upon his discharge from the military service, he accepted a Civil Service position in the office of the Adjutant General of the Army, being affiliated with that War Department Bureau until Aug. 19, 1917, when he again entered the military service, this time as a commissioned officer in the Quartermaster Corps with the rank of Major.

Assigned to duty overseas, he was in charge of the Personnel Section, Motor Transport Corps, American Expeditionary Forces. His ability in administrative and executive duties was amply attested by decorations and citations received in consequence of his assignments during that period. On April 1, 1920, he was honorably discharged from the military service with the rank he then held, that of Colonel, and was subsequently appointed as Colonel in the Quartermaster Reserve Corps. On August 21, 1926, he was transferred to the Air Corps Reserve.

Colonel Pierce entered upon duty in the Personnel Division, Office of the Chief of the Air Corps, as Principal Clerk, a position he held until his death. He probably had a wider acquaintance among the commissioned personnel of the Air Corps and a more comprehensive knowledge of personnel matters affecting this branch of the service than any other individual.

The loss of Colonel Pierce is keenly felt, and the deepest sympathy of the Air Corps is extended to his bereaved family.

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Under War Dept. orders recently issued, Major Junius W. Jones, Chief, Inspection Div., Office Chief of the Air Corps, goes to Newport, R.I., as student at Naval War College, 1933-34 course. Major Carl Spatz, March Field, to Office Chief of the Air Corps; Major Henry C. Harms designated as Asst. Commandant, A.C. Primary Flying School.

THE AIR CORPS DETACHMENT AT WEST POINT

By 1st Lt. J.M. Weikert, A.C.

This article is written with the idea of acquainting the Air Corps with the fact that an Air Corps Detachment is stationed at the United States Military Academy at West Point, N.Y.

It originated in 1927, upon the urgent request of Major George Stratemeyer, Air Corps, and Colonel C.C. Carter, Professor of Natural and Experimental Philosophy, in whose Department a course in Aerodynamics is given. The Chief of Air Corps then sent here one airplane, a Loening OA-1A Amphibian, one of the planes used on the Pan-American Flight. It is necessary to have amphibian or sea planes here to operate from the river, due to the absence of a landing field. A small hangar was soon erected, and operations were carried on by the two officers and one enlisted mechanic stationed here at that time. Various types of Loening amphibians were assigned here during the past five years, the last one being a Keystone-Loening OA-2, which was placed on survey last December.

The Detachment now consists of four officers and seven enlisted men. It is equipped with two airplanes, a Sikorsky, Jr., single engine, four-passenger cabin amphibian YIC-23, and one BT-2B on floats. A new hangar, 60x 110, with a clearance of 19½ feet, situated at the edge of the river on the north side of the post, was completed in Dec. 1932.

The West Point Radio Station is now part of the Air Corps radio control net and is in direct communication with Air Corps stations the last 15 minutes of every hour between 9:00 a.m. and 4:00 p.m. on all working days except Saturday, when they close at noon.

Major-General Wm. R. Smith started negotiations for a piece of land just south of Highland Falls, to be made into a landing field, but due to the necessity for economy the project was dropped. However, we hope some day to have a field for land planes as well as amphibians and seaplanes.

The four officers are instructors in the Academic Department, Lieuts. John M. Weikert and T.A. Sims in Technical Mechanics, Astronomy, Hydraulics and Aerodynamics; and Lieuts. R.E. Randall and C.A. Harrington in Mathematics. The Air Corps also furnished four assistant football coaches last fall, Lieuts. M.F. Daly, L.G. Saunders, N.B. Harding and A.W. Meehan.

During January of this year, a series of lectures on Air Corps Tactics was given to the graduating class of cadets. Several lectures were given by Air Corps officers stationed here to pave the way for a presentation of the picture of the Air Corps in its broader aspects by Brig. General Oscar Westover, Majors W.H. Frank, H.A. Dargue, B.Q. Jones and Capt. A.B. McDaniel. These lectures were both instructive and interesting to the cadets. One week after their termination, some 306 cadets out of 350 indicated their desire to join the Air Corps upon graduation by requesting the Air Corps physical examination.

A board of flight surgeons, consisting of Majors C.W. Cummings, E.F. Harrison, C.V. Shock, H.E. Fisher and Capt. J.M. Hargreaves met here February 6th to conduct the physical examinations. The results indicated that approximately fifty percent of the men passed successfully in other words, about 100 men will report to Randolph Field for flying training next fall.

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HIGH ALTITUDE TEST OF AERIAL CAMERAS

During the course of an experimental high altotude photographic flight from Bolling Field, D.C., to New York City on March 5th, for the purpose of testing the latest type aerial camer as used by the Army Air Corps, Captain Albert W. Stevens, photographer, and 1st Lt. Charles D. McAllister, pilot, experienced about the coldest weather they ever encountered during their flying careers. At an altitude of 24,000 feet the temperature was 37 degrees below zero, Fahrenheit, while at 26,300 feet, the highest altitude at which they operated, and where they remained for nearly 4 hours, the temperature went down to 51 degrees below zero, Fahrenheit. During the greater part of their flight of 5 hours and 35 minutes, the Army airmen hovered slightly west of Staten Island. A terrific gale from the north, which the officers calculated was blowing at the rate of over 120 miles per hour at this high altitude, kept their Fairchild cabin photographic plane practically stationary, although its air speed was supposed to be about 130 miles per hour. At times the plane was actually losing ground and was being forced backwards.

Lieut. McAllister stated that the climb to 20,000 feet required 40 minutes but that progress beyond that point slackened considerably. Both airmen used compressed oxygen while working in the rarefied atmosphere and, despite the fact that they were in a closed cabin plane and warmly clad, the penetrating cold made working conditions far from comfortable, since it was necessary to keep open a window through which to project the camera for oblique shots. Capt. Stevens stated one camera was frozen solid during the course of operations and that several of his fingers were nipped by the bitter cold weather.

The atmosphere was remarkably clear, the visibility being such that from their position over Staten Island they viewed the Hudson River as far as West Point, as well as the snow-covered Catskill Mountains beyond, also the whole length of Long Island; Long Island Sound, and in other directions, Trenton, N.J.; Philadelphia; Atlantic City; the big Navy airship hangar at Lakehurst, N.J., and other distant points. New York Bay, Capt. Stevens stated, looked like a huge map.

Both Capt. Stevens and Lieut. McAllister are stationed at the Materiel Division, Wright Field, Dayton, O. They were ordered to the Capital City for temporary duty for the purpose of taking official photographs of the Inaugural Ceremonies.

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TOUGH OPPONENTS FOR MARCH FIELD PISTOL TEAM

The March Field Pistol Team recently tackled some of the stiffest competition in Southern California, putting up a good showing in each contest. Among the teams chosen were the Riverside and Bakersfield Divisions of the State Highway Patrol, including several members of the State Championship team of that organization; and the Coast Artillery team from Fort MacArthur. Results of the two competitions held recently were:

Feb. 15th		Feb. 22nd	
Fort MacArthur	1351	Bakersfield	1368
March Field	1330	Riverside	1332
Riverside	1292	March Field	1321

The March Field team is composed of the following marksmen: Lts. Harding, Maxwell, Ott, Briggs, Ives and George.

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